

# **How To Prevent Drought Damage To Urban Trees**

## City Of Takoma Park Urban Forest Division “How To” Fact Sheet

### **Why The Concern?**

Drought (moisture deficiency) is the most common stress encountered in the urban landscape. Drought stressed trees lose foliage, grow slowly, and become more susceptible to attack by insects and diseases. Severe drought can kill trees, but usually it is a combination of drought and other stresses.

Drought stress can adversely affect every physiological process in a tree. The first response is the closure of leaf stomata. This reduces transpiration water loss and acts as a defense mechanism. However, with the stomata closed, carbon dioxide is not absorbed and photosynthesis is curtailed. This causes less food available for growth and storage. Also, less reserve food energy is stored and less energy goes into defense chemical production, causing trees to be more susceptible to secondary pathogens.

### **Visible Symptoms**

- . Drooping and/or wilting leaves.
- . Loss of turgor in needles or leaves.
- . Yellowing of leaves.
- . Premature leaf or needle drop.
- . Twig and branch die back.
- . Bark cracks.
- . Thinning of canopy.
- . Marginal scorch of leaves.
- . Stunted growth.



## **Factors That Exasperate Drought Conditions**

- Compacted soil. Most soils in the urban environment are denser and more compacted than soils in natural settings. Water has a higher tendency to not be absorbed into the soil in the urban environment and thus be available to trees.
- Improper pruning. When pruning trees, it is important to leave some of the interior canopy. In the heat of summer, leaves that are in direct contact with the sun during water shortage conditions tend to temporarily shut down their transpiration process. By having leaves in the interior of the tree, shaded leaves can still go through the transpiration process, thus having a healthier tree.
- Excess hardscape. Two problems arise from excess hardscape. One is the amount of impervious surface created so trees have less opportunity to absorb water. The second is urban hardscape tends to create heat. Excess heat can make a drought situation worse.
- Fertilizing during drought. Never fertilize trees during drought conditions. Fertilization encourages growth. Growth is not needed during drought conditions; it just gives the tree more area that needs water.

## **How To Prevent?**

- Water trees regularly. Bartlett Tree Research Laboratories have stated that “without rainfall, (trees) require approximately 750 gallons of water per 1000 square feet of soil surface beneath the crown during each week of the growing season”. Water your trees by using a garden hose and just drop it a few feet from the base of the tree. Turn the water on to a slow flow (to prevent runoff) and walk away. Every 15-30 minutes move the hose to another part of the root zone. The purpose is to get the water to soak into the soil at reasonable depths to do maximum benefit to the trees’ roots. It is not practical to water a mature tree 500-750 gallons each week, but every bit helps.
- Mulch trees. Organic mulch helps to maintain soil moisture and keeps the ground cooler in the summer. But too much can be a problem. Never mulch deeper than 3 inches in depth, and rake and water the mulch regularly.
- Use ground covers instead of turf grass. Ground covers do not prevent the percolation of water that turf can.
- Aerate soil to lessen compaction and encourage water penetration. Urban soils are usually very compacted. This prevents proper penetration of water to tree roots. By aerating the soil, water can better reach the roots of trees.

The perception of drought can be misleading. Regions can experience severe droughts but have total rainfall for the year appear at normal levels. The “normal” annual rainfall figure could be accounted for by a significant amount of rain that fell in just one event. With respect to influence on plant growth and health, it is the amount and frequency of rainfall received that is of greater significance than the total amount of precipitation in a given year. When defining a drought over a specific time period, the pattern and frequency are much more important than the total amount of rain received.